



OKLAHOMA

Sciences & Life Sciences Achievement

STUDENT ACHIEVEMENT

NAEP Grade 8	OK	U.S. Avg.	State Rank
Science Average, 2005	146.5	147.1	27
Science, 2005 (% at or above "proficient")	25.3%	27.3%	29
Life Sciences Average, 2005	146.2	148.2	31

ACT	OK	U.S. Avg.	State Rank
Science Average, 2008	20.4	20.8	39
Biology, 2008 (% of students ready for college level)	24%	28%	39

AP	OK	U.S. Avg.	State Rank
Science Scores, 2008 (% with a score of 3 or higher)	39.3%	55.4%	45
Science Exams, 2008 (Exams as % of all H.S. grads)	7.5%	10.5%	32
Biology Scores, 2008 (% with a score of 3 or higher)	30.7%	49.8%	49
Biology Exams, 2008 (Exams as % of all H.S. grads)	2.7%	4.6%	39

SCIENCE TEACHER QUALITY and PROFESSIONAL DEVELOPMENT	OK	U.S. Avg.	State Rank
Science Teachers with Major in Assigned Field, 2003–04 (% , Grades 7–12)	61%	77%	44
Science Teachers Certified, 2006 (% , Grades 7–8)	59%	N/A%	21
Biology Teachers Certified, 2006 (% , Grades 9–12)	99%	88%	6

Note: NAEP = National Assessment of Educational Progress, AP = Advanced Placement
N/A = Data not available.

Key Organization(s) Promoting Examples of Bioscience Education Activities

Teacher Preparation and Professional Development

Biotechnology/Bioinformatics Discovery! Program that provides an array of resources for middle- and high-school science teachers, including the following:

- More than 25 **modules with lesson plans** to use in high school biology

OK STATE SCIENCE STANDARDS & REQUIREMENTS

STANDARDS PROFILE

- Most recent update of K-12 Science Standards: NA
- Next scheduled update: **2011**
- Research scientists provided input in development of standards
- Science standards specifically mention applied laboratory or other tools for biotechnology or biosciences

BIOSCIENCE-RELATED GRADUATION REQUIREMENTS:

One unit of biology required for graduation



classes, another 25 modules to be used in biotechnology, advanced placement biology, and biology II classes and 4 modules for use in pre-biotechnology labs in middle schools

- **Discovery! Kits for Educators** that provide the equipment to conduct the labs associated with the various modules
- **BBDiscovery Workshops** at OCCC for high school teachers at different levels of infusion into the high school classes. Workshops are offered at rural sites on an ongoing basis.

Tulsa Community College's (TCC's) Stimulating Enthusiasm, Exploration, and Discovery through Biotechnology Education (SEEDBED) project seeks to stimulate a pipeline of biotechnology students at TCC, leading to highly skilled biotech professionals in the region of northeastern Oklahoma and surrounding areas. SEEDBED aims to adapt biotech-related learning materials to meet Oklahoma secondary science standards and implement them in middle and high schools, provide education for teachers to easily and effectively incorporate inquiry-based biotech experiments and discussion into their science curriculum, and provide students with a seamless educational pathway leading to a career in biotechnology.

The **Oklahoma Medical Research Foundation's (OMRF's) Foundation Scholars** program provides a hands-on lab experience for high school teachers for 4 weeks in the summer.

The **University of Oklahoma's (OU's) K20 Center** provides professional development and support for elementary teachers in science as inquiry, effective teaching practices, use of technology, and lesson study. Program offerings include the following:

- **REESE Science Initiatives** include two professional development opportunities that are targeted toward science teachers in grades 7 through 12. The first is **Probing into Inquiry in the Classroom (PIC)**, a full-day workshop at OU in which secondary science teachers explore classroom inquiry techniques using scientific data collection probeware. The second is **KREST (K20 Research Experience for Science Teachers) Institute**, a 2-week summer research experience for teachers with OU scientists in conjunction with workshops exploring novel approaches to science instruction.
- **Oklahoma Science PDI K20 Improving Science Across Oklahoma** assists teachers in improving science instruction by providing intensive training in science content and inquiry processes. The Science PDI is administered by the Oklahoma Commission for Teacher Preparation and is funded by the Oklahoma State Legislature. The Science PDI is a whole-school initiative that is directed toward teachers within elementary and middle schools who deliver science instruction. The focus of the Science PDI is to build science communities of practice within the larger context of professional learning communities.
- **Ardmore City Schools** partners with the K20 Center to provide professional development for science teachers in the use of process-based curriculum, lesson development, technology, and effective teaching strategies.

The Oklahoma State Department of Education's **Non-Traditional Teacher Licensure Program** was created to prepare qualified individuals to



meet the need for teachers in critical shortage subject areas across the state. Recognizing that professional experience, knowledge, and previous career successes can positively impact the lives of students, the Oklahoma Non-Traditional Teacher Licensure Program allows qualified professionals, with a variety of work experiences, to teach in a school classroom setting.

Experiential Learning and Outreach

OMRF's **Fleming Scholar Program** is designed to give Oklahoma's high school and college students hands-on experience in biomedical research. Fleming scholars work in state-of-the-art biomedical research laboratories on individual projects and are supervised by senior members of the OMRF scientific staff. The scholars attend weekly seminars by OMRF scientists. On the final day of the program, the scholars give formal scientific seminars outlining the findings of their projects. Each scholar also writes a scientific paper summarizing his or her summer project that is published.

The OU Graduate College, Graduate Student Senate, Honors College, and K20 Center host an annual **Student Research and Performance Day (SRPD)**, at the National Weather Center

located on the OU South Research Campus. Graduates, undergraduates, and kindergarten through 12th grade (K-12) students participate in this forum at which students are able to present their current research, paintings, photography, sculpture, video, etc., through the use of portfolios, posters, and slide or video shows. Students from all academic areas can participate.

Bioscience-focused Schools and Programs

The Francis Tuttle Technology Center, a consolidated technology center district composed of six school districts, offers a **Biosciences and Medicine Academy** for high school students. The Academy offers only pre-advanced placement (AP) and AP math and science classes combined with medically related classes to provide students with the academics they will need to be successful in a bachelor's program and an understanding of the broad field of biosciences and medicine.

Oklahoma's **Career Tech Centers** offer high school courses in biotechnology and biosciences.





Basic Skills Achievement and Other Summary Metrics

STUDENT ACHIEVEMENT

NAEP Grade 8	OK	U.S. Avg.	State Rank
Math Average, 2007	274.5	280.2	40
Math, 2007 (% at or above "proficient")	21.3%	31.0%	44
Reading Average, 2007	259.5	261.0	34
Reading, 2007 (% at or above "proficient")	26.1%	29.2%	37
Writing Average, 2007	152.8	154.3	30
Writing, 2007 (% at or above "proficient")	26.3%	30.6%	33

ACT	OK	U.S. Avg.	State Rank
Percentage of Graduates Tested	70%	43%	15
Math Average, 2008	19.8	21.0	44
Reading Average, 2008	21.4	21.4	36
English Average, 2008	20.5	20.6	35

SAT	OK	U.S. Avg.	State Rank
Percentage of Graduates Tested	6%	48%	42
Math Average, 2008	572	515	12
Critical Reading Average, 2008	572	502	13
Writing Average, 2008	557	494	15

AP	OK	U.S. Avg.	State Rank
Math Scores, 2008 (% with a score of 3 or higher)	52.1%	65.2%	46
Math Exams, 2008 (Exams as % of all H.S. grads)	5.5%	8.7%	37
English Scores, 2008 (% with a score of 3 or higher)	46.4%	59.2%	46
English Exams, 2008 (Exams as % of all H.S. grads)	18.7%	18.9%	18

SUMMARY STATE EDUCATION METRICS

Selected Indicators	OK	U.S. Avg.	State Rank
High School Graduation Rate, 2005–06	77.8%	73.4%	21
Student/Teacher Ratio, 2006–07	15.1	15.5	31*
Low-income Students, 2006–07 (% of all students)	55.2%	41.6%	–
Expenditure per Student (\$), 2005–06	\$6,941	\$9,154	48

Note: NAEP = National Assessment of Educational Progress, AP = Advanced Placement
N/A = Data not available. * Lowest value receives highest ranking.

TABLE SOURCE NOTES:

NAEP Assessments, grade 8: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (NCES), National Assessment of Educational Progress (NAEP), 2005; **ACT Exam:** ACT, Inc., 2008; **SAT Reasoning Test:** The College Board, 2008.

Advanced Placement (AP): Battelle analysis of data from the College Board, 2008; AP test takers as a share of high school graduates includes graduate data from U.S. Department of Education, NCES for both public (Common Core of Data) and private high schools (Private School Survey).

Science Teacher Indicators: Council of Chief State School Officers (CCSSO) analysis of State Departments of Education data on public schools, 2007; U.S. Department of Education, NCES Schools and Staffing Survey, 2003–04 as reported by CCSSO, 2007.

Summary State Education Metrics: U.S. Department of Education, National Center for Education Statistics (NCES), Common Core of Data (CCD) on public elementary and secondary education.

Note: High school graduation rates are averaged freshman graduation rates—the rate is the number of graduates divided by the estimated count of freshmen 4 years earlier. U.S. figure for share of students eligible for free or reduced-price school lunch ("low-income" students) is available for 2005–06 only (state data are for 2006–07).